Manual for installation and maintenance

Therm DUO 50 FT

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1. USAGE

THERM DUO 50 FT is an advanced wall-mounted source of heat energy for premises with the maximum heat loss of 45 kW. It can be used separately or in a cascade for large buildings. The demanded output of the boiler room will be acquired by using more Therm Duos in a cascade, which is controlled by its own expansion regulation including weather compensated regulation. In this easy way you can acquire a heat source with high efficiency. The construction of boilers in a cascade lowers the operational costs and losses compared to standard boiler rooms. The boilers are designed as appliances with maximum efficiency and minimal emissions to the air, their operation is economical and it does not harm the environment. The boiler output is adjustable within 50 and 100 % and it adapts itself to the current needs depending on heat losses.

The high technical standard is guaranteed by the use of top components from the best world producers.

Important: *The boiler is designed for heating systems equipped with an open expansion vessel with min. height of 8 m above the boiler.*

2. GENERAL DESCRITPTION OF THERM DUO 50 FT

All functional parts of THERM DUO 50 FT are fixed to a metal supporting frame. There are two copper flue exchangers in its upper part. Their surface is protected by an aluminium and silicone mixture. Inside the tube sheet there are turbulators, which have to be protected against blocking by dirt from the heating system. Therefore, it is necessary to install a filter at the return water inlet in the boiler. To maintain the minimum losses of heat transfer it is essential to keep exchanger lamellas clean. The exchanger usually gets dirty when dust particles are burned (the boiler operates in a dusty environment). There are automatic deaerating valves on the inlet and safety contact thermostats on the outlet of the flue exchanger.

The combustion chamber is made of aluminium plated metal sheet and it is inlaid by a heat insulation. The front wall is removable. Above the exchangers there is an exhaust rectifier.

There is an eighteen-armed, water-cooled, low NO_X gas burner in the lower part of the combustion chamber. The burner is a product of POLIDORO. It has an advanced modular construction and it is fitted with three electrodes. Two of them (ignition electrodes) ignite the burner; the third (ionization electrode) checks the burning

SIT gas fitting is connected to the burner by a grommet and screwing. The fitting includes a gas pressure regulator and two solenoid valves controlled automatically.

There is also a modulating electromagnet. The magnetic coil core of the modulator has an adjustable lift so gas pressure into burner can be adjusted within the set range.

There is a Grundfos pump on the return water inlet. The pump drives the water through the boiler. The sufficient through-flow is watched over by a through-flow switch. Moreover, there is a safety valve connected to in front of the pump to protect the boiler against excess pressure.

The control panel is made of plastic. The control elements are placed on the front of the plastic control panel (see the operational rules). There is a DIMS01-TH01 microprocessor automatics for boiler control inbuilt inside

THERM DUO boilers work without an ignition burner and they are ignited with an electric spark, which means greater gas savings.

The ventilator and the components engaged in gas combustion and power transformation are inbuilt in a closing chamber. The sufficient supply of combustion air and the forced flue exhaust are usually ensured by the coaxial tubes that go horizontally through the perimeter wall or vertically through the roof construction out into the open space. The coaxial tubes must be installed in such a way that any penetration of rainwater or condensed water into the boiler can be averted. It is therefore necessary that the vertical tubes be finished with a stack, whereas the horizontal tubes must be installed with a moderate fall in the direction from the boiler to the flue exhaust. Should these instructions be disregarded, the components inside the closing chamber, in particular the flue ventilator, are easily liable to damage.

The ventilator's operation is checked by manostat. When the electric manostat contact closes the ignition cycle starts and the burner is ignited.

GRUNDFOS 15/60 pump is used for this version. Graph for usable connecting overpressure of heating water with max. boiler output and heat slope up to 20°C shows relatively low excess pressure for the heating system. It is necessary to remember to use an additional system pump, mainly when a separate boiler is installed into a heating system (especially with horizontal distribution nets).

It is necessary to use 80/125 mm flue gas ducting for this type of boiler. Proportion of outlet flue gas ducting is 60 mm. Don´t forget to put reduction (from 60/100mm to 80/125mm) pipe directly on the boiler flue outlet.

It is possible to use a distributor above the boiler and lead a separate pipe through which the combustion air will be supplied and another through which the flue gas will be exhausted.

3. TECHNICAL SPECIFICATIONS

	units	**DUO 50 FT**
Flue		natural gas
Boiler category		I_{2H}
Maximum heat input	kW	49
Minimum heat input	kW	27,5
Maximum heat output for heating	kW	45
Minimum heat output for heating	kW	25
Number of burner nozzles	ks	36
Nozzle drilling :	mm	1
Gas excess pressure at the inlet:	mbar	20
Gas pressure at burner nozzles:	mbar	4 – 12
Gas consumption:	m^3/h	2.9 – 5.2
Max. heating system excess pressure	bar	3
Min. heating system excess pressure	bar	0.8
Max. heating water outlet temperature	°C	80
Average flue temperature	°C	100
Max. weight flue flow	$g.s^{-1}$	44.7
Max. noisiness	dB	53
Boiler efficiency	%	92
Boiler NO_x class		5
Nominal supply voltage / frequency	V / Hz	230 /50
Nominal electric input	W	150
Nominal fuse current	A	1.6
Level of electric components cover		IP 41
Surroundings according to valid norms		common AA5/AB5
Flue exhaust diameter	mm	80/125 (2x80)
Dimensions: height / width / depth	mm	900/600/475
Boiler weight	kg	52

4. PRODUCTION CHECK

All boiler parts are rechecked and set by the manufacturer before they are assembled. Each boiler is tested for water system staunchness, gas system staunchness; regulating and safety components are rechecked and set.

5. INSTRUCTIONS FOR BOILER MOUNTING

Boiler mounting can only be done by a qualified expert company, while this has to respect all the advice and notes in this manual. The mounting has to be carried out in correspondence with valid local norms and regulations and technical guidelines.

The mounting company is required to check:

- if the boiler type is the ordered one
- the choice of boiler was correct as far as the situation is concerned (gas type, heating system, exhaust)
- the delivery is complete

In case of any doubts, inform the manufacturer or the supplier before mounting.

♦ Position of the boiler

The design and construction of **THERM DUO FT** boilers enable them to be used both in places of living and other places (boiler rooms etc.). The boilers have **IP 41** cover of electrical parts, which fulfils the conditions for resistance to vertically dripping water.

The room where the boiler is placed must be a common basic surroundings AB5 protected against frost, with ambient temperature within + 5 °C and + 40 °C with relative humidity lower than 80 % according to valid norms. The combustion air must not contain halogen hydrocarbon or aggressive vapours, it must not have high humidity and dustiness.

The size of the room where the boiler is installed and its airing must follow valid technical regulations.

Important!

No flammable objects can be placed within the safe distance from the boiler (i.e. 50 mm), and within the safe distance from the exhaust pipe and check glass (i.e. 200 mm). The wall where the boiler is mounted must be made of inflammable material.

Before any work which could change the surroundings of the boiler starts, you have to switch off the boiler by the mode switch (pointer to „0“).

♦ Boiler hanging

Before the boiler is mounted make sure the chosen place meets the requirements for flue exhaust placement and for minimum distances stated in the previous chapters. If the boilers are place in a cascade we recommend fitting them on a common supporting structure.

♦ Boiler connection to warm-water system

Boiler rooms with THERM DUO 50 FT cascades must be solved by a project according to hydraulic ratio calculations with respect to total outputs.

The connection of boilers to heating distribution systems and gas distribution must be carried out so that the boiler outlets are not strained.

Before the boiler is connected it is necessary to purge the heating system to remove all impurities and sediments. The return water inlet must be fitted with a suitable filter.

The heating system must observe the relevant local norms.

Make sure the minimum excess pressure of the heating system is 0.8 mbar.

♦ Boiler connection to gas

The boiler must always be connected to gas by a professional company with valid certification and its professional certified employees and according to the approved documentation for gas fitting. The gas regulator is not to be fitted in front of the boiler, as it is inbuilt in the gas armature, which is a part of the

boiler. A round gas cock with a certificate for gas must be fitted to the boiler's gas inlet. The gas cock must be freely accessible.

The boiler is designed for natural gas with 9 to 10.5 kWh/m^3 heating power and 20 mbar nominal pressure in the distribution net.

Important!

If you change the boiler to another gas type it is necessary to dismantle burner's ramp, to change the nozzles and to reset the min. and max. pressure on the gas fitting. Further, it is necessary to reset the concerned parameters on the modulation electronics. The change and resetting can only be carried out by a trained service worker certified by the manufacturer.

♦ Boiler connection to supply mains

The boilers are equipped with a triplex flexible cable with a plug. They are to be plugged in the socket nearby so that the plug is accessible even after the boiler is mounted. The socket must be protected by a neutral or an earthing, with the protection pin at the top and the neutral connected on the right from the front view. The mains voltage must be 230 V ± 10 %. The socket installation, the connection of the room thermostat and the maintenance of the boiler's electrical parts can only be provided by a professional person qualified for electrotechnical work pursuant to the valid norms.

♦ Boiler connection to chimney

In order to exhaust the flue gas and supply enough combustion air in the boiler, a double pipeline (80/125 mm) is usually used. These pipelines are provided by the manufacturer of the boilers and it is possible to order them according to the concrete project's specifications (horizontal or vertical exhaust including gasket sleeves, o-rings, etc.). It is logically possible to use a distributor above the boiler and lead a separate pipe through which the combustion air will be supplied and another through which the flue gas will be exhausted. Given the wide range of possible solutions, the exhaust components are not delivered as the standard boiler fixtures.

Connection of the boilers to solid flues must be carried out in compliance to the valid local norms. A concrete solution of flue exhaust must be dealt with in a corresponding project that complies with the standard rules relating to the situations when the condensed water needs to be drained or penetration of rain water into the boiler averted.

The maximum length of the coaxial flue exhaust approved by the manufacturer:

Horizontal piping – 3 metres – measured from the elbow of the appliance to the opening on the façade. Each 90° elbow that comes next reduces the length by 0.75 m, each 45° elbow by 0.5 m.

Vertical piping – 2.7 metres – measured from the appliance to the bottom of the room terminal. Each 90° elbow that comes next reduces the length by 0.75 m, each 45° elbow by 0.5 m.

If you use the distributor as well as an exhaust piping and induction piping with the diameter 80 mm, the maximum length is 6m (sum of exhaust and induction)

♦ Heating system filling

During the time when the heating system is being filled with water the boiler must be unplugged. The recommended heating water pressure is the range of 1 ÷ 1.5 bar when the system is cold. It must be filled slowly so that the air bubbles can escape through deaerating valves. The water used for both first filling and refilling must be clear, colourless, without suspended solids, oil or chemically aggressive additives, it must not be acid (pH lower than 7), with the minimum carbonate hardness (max. 3.5 mval/l) or it must correspond with the relevant local norms. If the water is modified because of hardness, only the agents recommended by the manufacturer are usable.

If any of the previously mentioned conditions is not met, the guarantee does not apply to the damaged components.

♦ Choice of regulation and control elements

The boiler is equipped with basic regulation and safety elements, as follows from the following wiring diagrams. As further expansion, it is possible to use regulation according to the temperature in the selected reference room or the weather-compensated regulation of the heating water, or a combined regulation.

A wide range of thermostats is available at the manufacturer for the room temperature control, e.g. SIEMENS REV 23, Honeywell CM 707, CM 67 or Electrobock PT 21, PT 30 and others. For the weather compensated regulation Thermona offers the outside sensor THERM Q01.

There is also a high quality regulation element – intelligent programmable SIEMENS QAA 73.110, which communicates with the boiler's automatics microprocessor through IU02Q interface. In this way not only information about the required heating system temperature depending on the room and outside temperature is transmitted but also the information about the boiler'operation is displayed (mode, output, temperatures, malfunctions, possible DHW tank heating switch off etc.). This system includes a lot of adjustable and displayed parameters for optimal control of the heating system with boiler output modulation.

Boiler rooms with cascades can be controlled with our unique system of communication among individual boilers. For this purpose there is interface IU 04.10, which transports the output needs of the boiler room calculations and information between the boilers (it influences the number of working boilers and their outputs). For even better communication interface IU 05Q can be used for the controlling boiler. This interface includes the features of IU 04.10 interface (communication among boilers) and features of IU 02Q interface (communication with programmable QAA 73.110). This kind of communication offers more programmable options and it displays the operational modes of the boiler room (modes, output, temperatures, failures, communication failures, possible DHW tank heating switch off during night etc.).

Recommendation: *We recommend controlling the actual boiler operation (without weather-compensated regulation) at least by a basic room thermostat. The room temperature is constant and it keeps the boiler in longer operational modes. It is also recommended to set the boiler thermostat to 60 ºC in autumn and spring and to 80 ºC in winter. It is advisable to use the inbuilt weather-compensated regulation either separately or with a room thermostat (see lower).*

These expansion regulation types are not delivered with the boiler.

♦ Starting the boiler

Only a service technician certified by the manufacturer can start the boiler for the first time.

Before the first ignition it is necessary to carry out the following steps:

- ❖ make sure the heating system is filled with water and the boiler is deaerated
- ❖ make sure all valves are open
- ❖ open gas tap and check the gas installation for leaks.

The procedure for first ignition:

- ❖ set the output temperature knob to maximum
- ❖ plug the supply in and switch on the boiler by the mode switch
- ❖ when you shortly turn the mode switch to the failure unblocking mode the boiler ignites automatically (if the gas supply is deaerated properly)
- ❖ check if all the safety thermostats and control elements work correctly
- ❖ check the setting of the boiler output range, adjust the setting according to the needs of the heated building if necessary

Important:

The boiler output range setting and other parameters must follow technical specifications. ***In case of overloading or improper use may result in damaging the boiler. Components damaged in such a way are not included in the guarantee!***

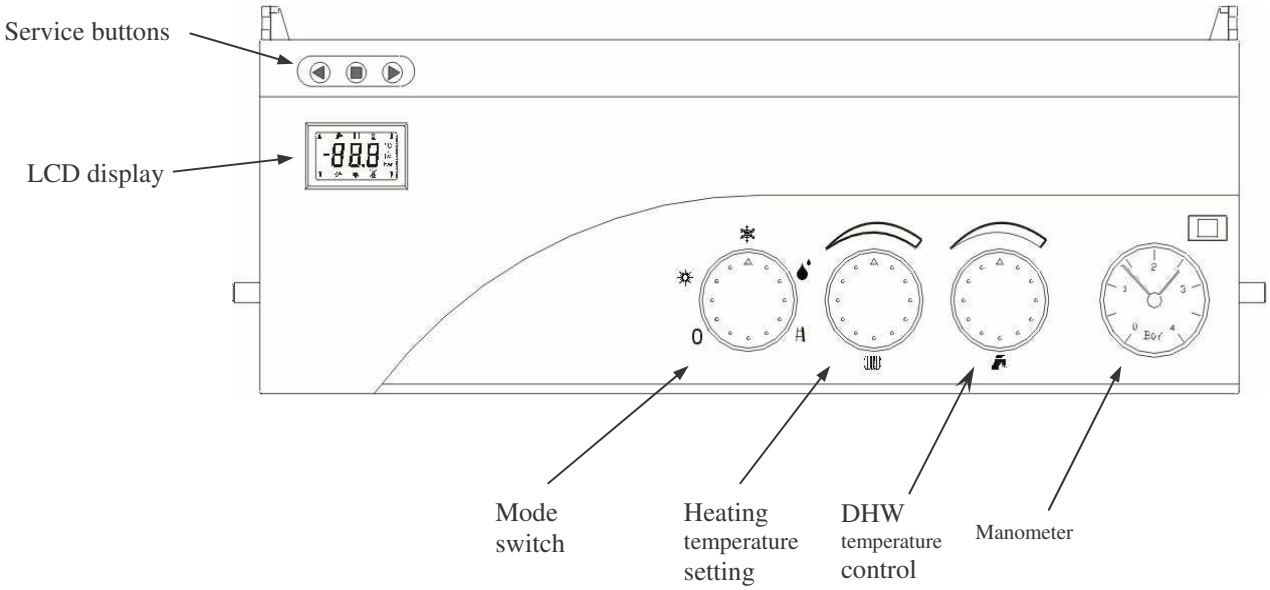
♦ Disconnecting the boiler

The boiler can be switched off by mode switch or by the switch on the room thermostat.

For long-term disconnection outside the heating season (e.g. during the summer holiday) it is advisable to close the gas tap.

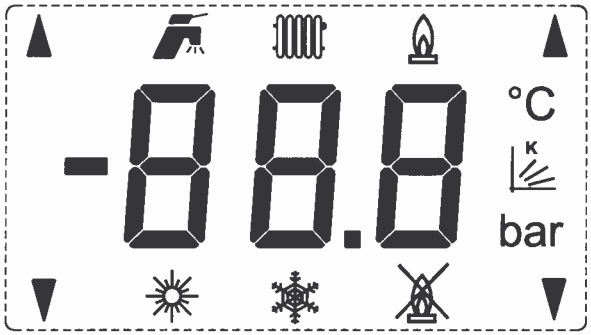
6. REGULATIONS FOR CONTROL AND MAINTENANCE

♦ Boiler controls



- ❖ **Service buttons** – used for diagnostics and boiler parameters setting.
- ❖ **Heating temperature control** – turning knob for user's setting of water temperature in the heating system within 35 – 80° C (the recommended range is 55 – 80° C). If weather compensated regulation is used, you can set the heating curve (within ± 15 °C from the weather compensation curve).
- ❖ Setting of DHW temperature is available only on CX and TCX boilers
- ❖ **Manometer** – show the water pressuer in the heating system.
- ❖ **Mode switch** – includes these modes:
- ❖ **0** Boiler switch off
- ❖ Summer (DHW heating into tank on, heating off)
  Winter (both heating and DHW heating into tank on)
  Failure unblocking
  Service mode (heating is on at the max. output and temperature). This mode is used for service measurements (emissions, flue temperature etc.).

♦ LCD display :



The meaning of the used symbols:

-88.8 - temperature, failure modes and service data in digital numbers
- heating mode (heating temperature displayed)
- boiler burning
°C - temperature symbol
- K factor value displayed (weather compensated mode)
- summer mode selected
- winter mode selected
- boiler ignition failure
- symbols for indication of communication with the connected interface(IU02Q,IU04.10, IU05Q)

The set temperature indication:

When you turn a knob for heating or DHW heating control the relevant mode symbol starts flashing and the display shows the temperature which is being set, i.e. the display shows the changes of the temperature. When you stop adjusting the set temperature is shown for another 5 seconds. After that the display shows the real temperature of the current mode again.

Failure or operational values exceeding indication:

The LCD display shows „E“ and failure code (for codes see the following chart)

failure code	meaning
E01	ignition failure
E02	insufficient heating water through-flow (between repeated attempts)
E03	-
E04	heating water sensor damaged
E05	DHW sensor damaged (only for boilers with DHW through-flow heating)
E06	heating water temperature limit broken (safety thermostat) or transition resistance on microswitch of through-flow switch
E07	outside temperature sensor damaged (for weather compensated regulation)
E08	flue exhaust failure (flue thermostat reaction), or reaction or failure of manostat (for turbo boilers) or transition resistance on microswitch of through-flow switch
E12	insufficient heating water through-flow (after repeated attempts)
E13	microswitch test

Other kinds of information shown on the display:

Using service buttons (buttons in the top left corner; right arrow „▶“ – step forward, left arrow „◀“ – step backwards) you can see these parameters in this order:

1. The set temperature of the heating water (+ °C + flashing value).
2. The real temperature of the heating water (+ °C + the value).
3. The set temperature of DHW * (+ °C + flashing value).

4. The real temperature of DHW * (+ °C + the value).
5. Outside temperature ** (+ °C + the value).
6. Weather compensation curve change ** (+ the value).
7. Back to standard display

The value in numbers is shown with the relevant symbol for 10 seconds after you stop making steps. Then again the display returns to the standard mode.
(*) – For „X and XZ“ boilers there is no value displayed (the display shows “- -“)
(**) – These parameters are displayed only when the boiler operates in the weather compensated mode (and when the outside temperature sensor is connected and not damaged).

When the boiler is controlled by QAA 73.110 room regulator with IU02Q interface the communication Open-Therm is signalled by top arrows in the display corners „▲▲“, when it is a communication of a cascade (IU04.10 and IU05Q) it is signalled by bottom arrows „▼▼“ .

♦ Maintenance

Regular maintenance is very important for reliable operation, long life and combustion efficiency. We recommend the user to contact the local service company and to agree on regular yearly boiler checks. (see also Conditions for guarantee claims). A service technician can e.g. check the control and safety elements of the boiler, check the gas and water installations or clean the burner and exchanger.

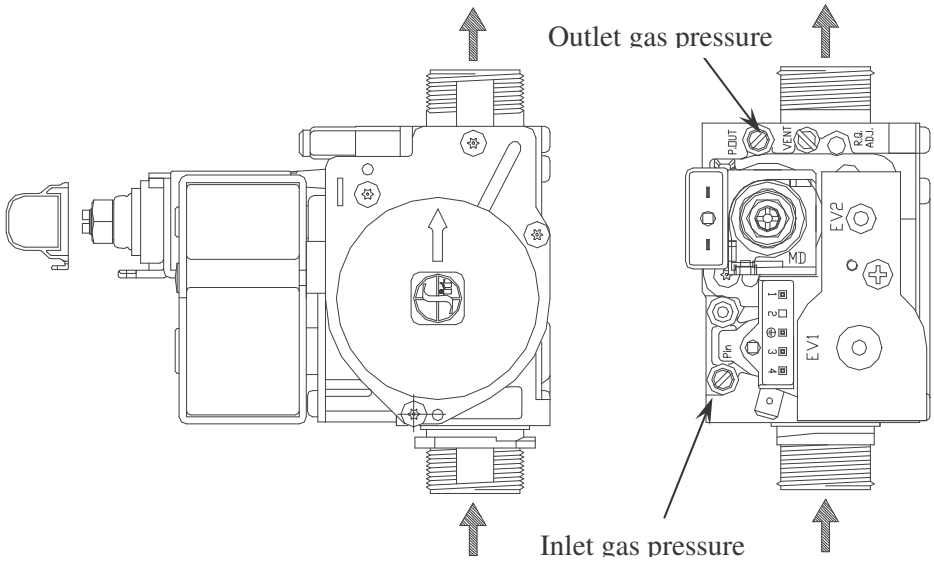
It is also necessary to check the pressure of cold water regularly. If the pressure is low it is vital to refill the heating system.

The user can clean the outside case with a cloth dipped in soap water and then dry it.

7. GAS FITTING SIT 845 SIGMA

Sampling points for gas pressure measuring:

Gas fitting SIT 845 SIGMA is equipped with two sampling extensions for gas pressure measuring (see the picture). The extensions are standardly equipped with tightening screws, which are to be loosened for measuring. After the measuring they have to be carefully tightened again (the recommended tightening moment is 1 Nm).

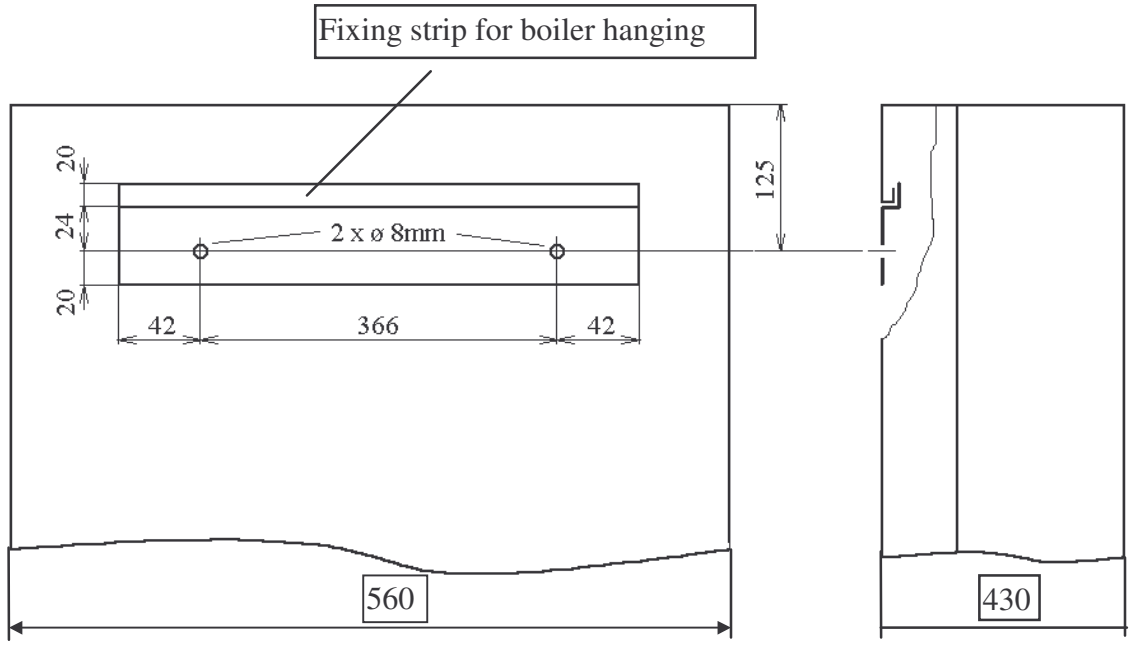


The setting of maximum, minimum and starting power is to be carried out by a service company worker and following the service manual.

Important:

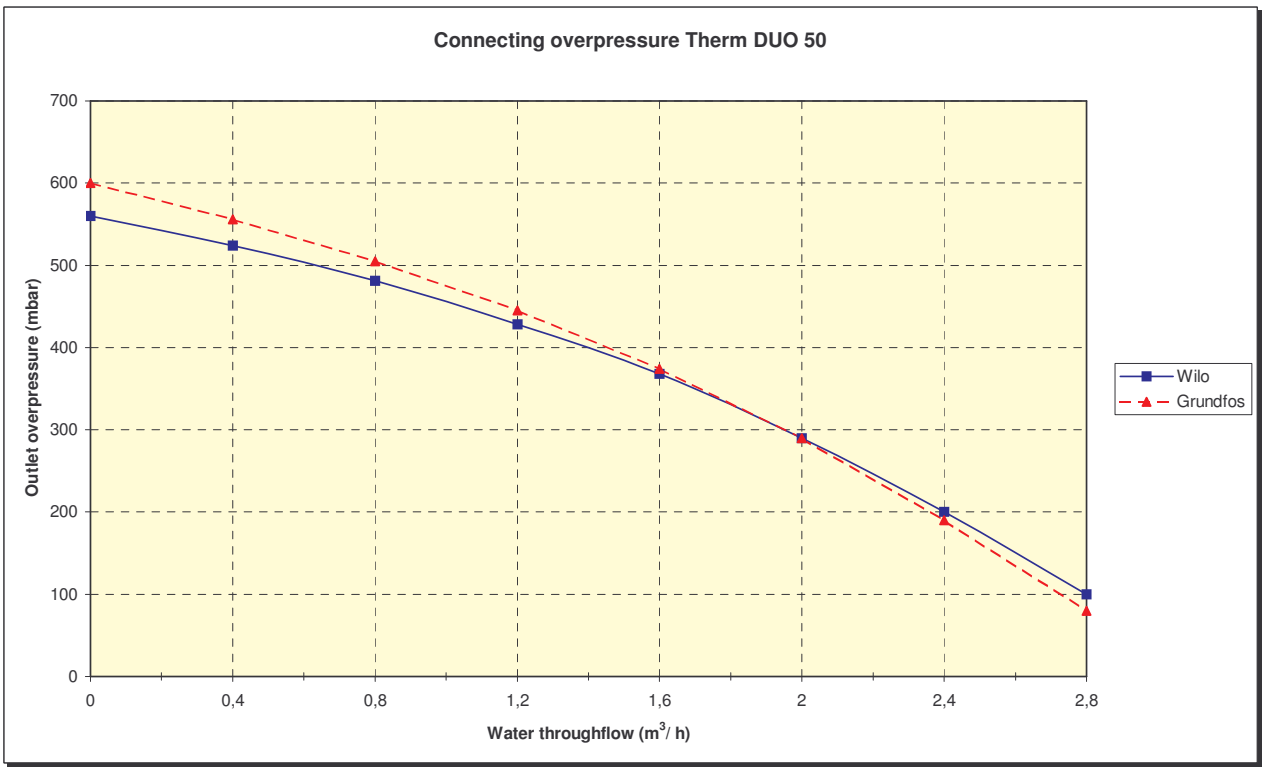
The system for the setting of gas pressure range on modulator is protected by a plastic cover. That is removed for gas pressure setting and after the setting it is necessary to put it in its original place (necessary for correct work of modulation coil).

8. BOILER HANGING



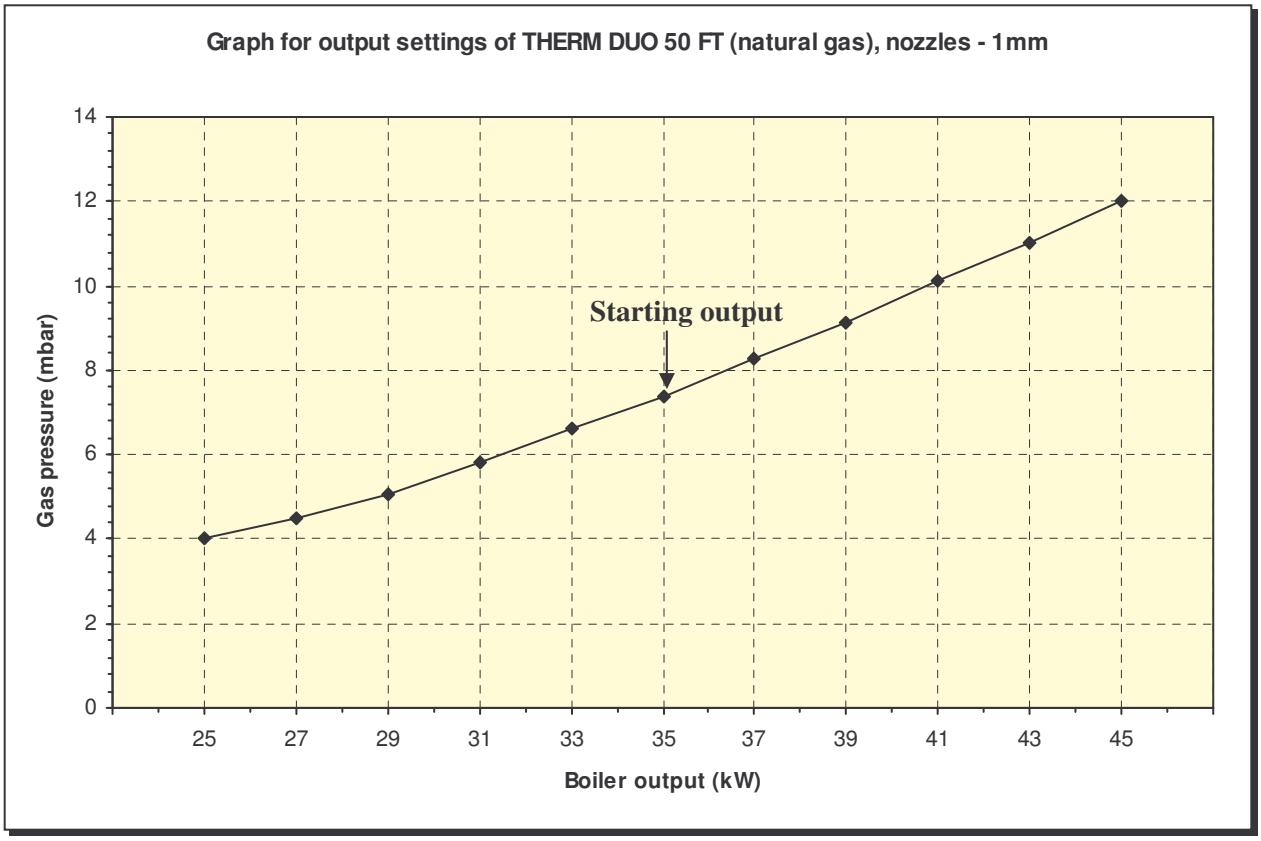
9. GRAPHS FOR OUTPUT AND CONNECTING EXCESS PRESSURE SETTING

9.1 Graphs of usable connecting overpressure of heating water



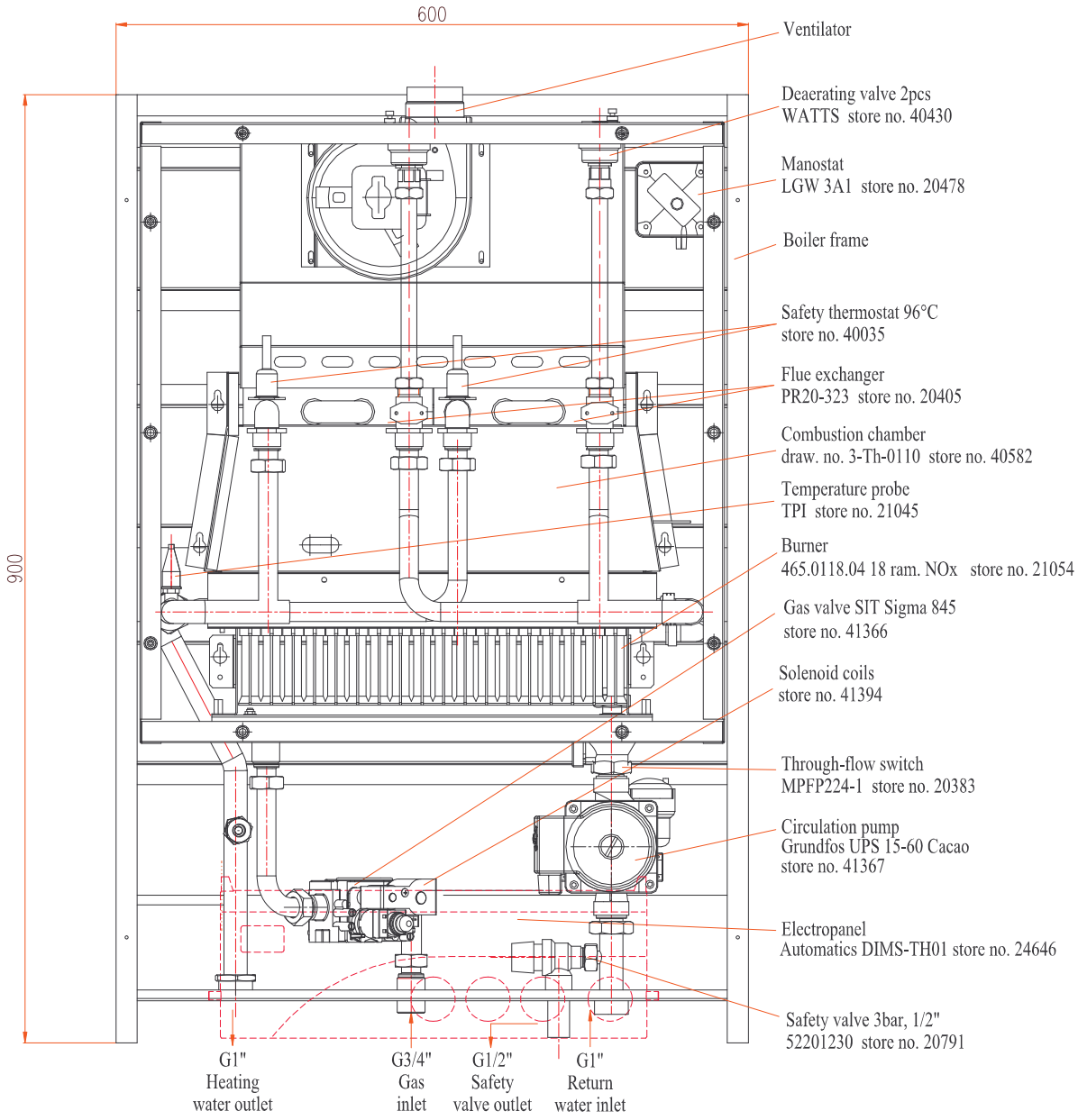
Important: *The curves of usable connecting overpressures of heating water are done for Wilo 25/70 and Grundfos 15/60 pumps at the highest level of regulation. We do not recommend lowering the pump output because of the boiler output and circulation features of the exchanger.*

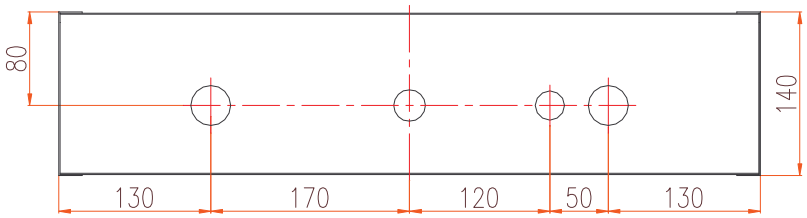
9.2 Graphs for boiler output setting

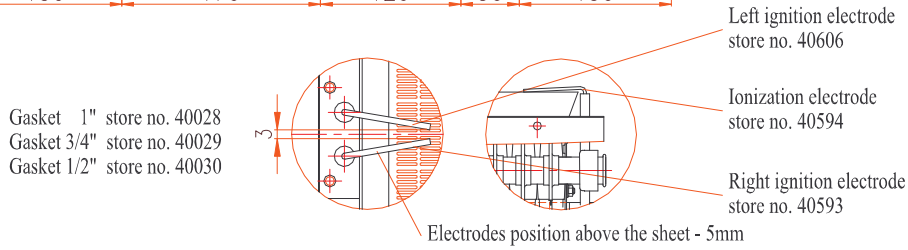


10. BOILER SETS

10.1 THERM DUO 50 FT set - front view

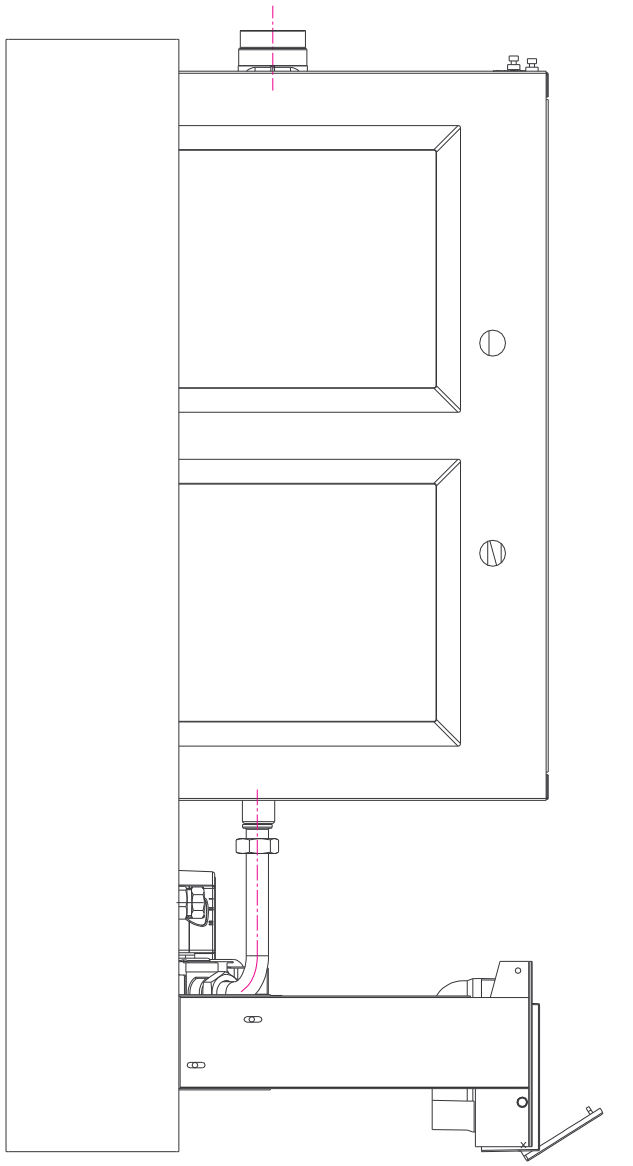


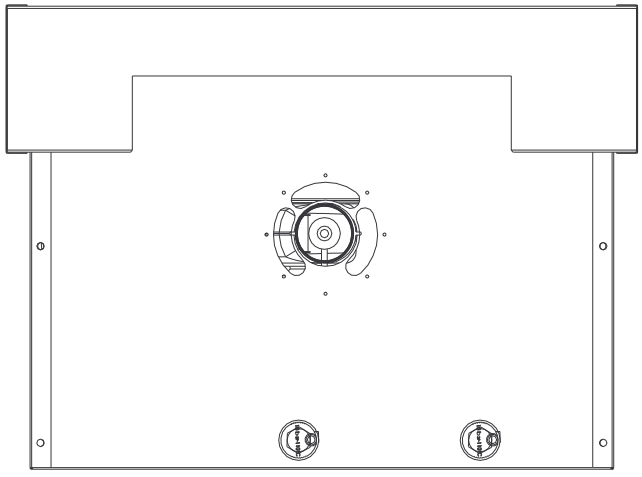




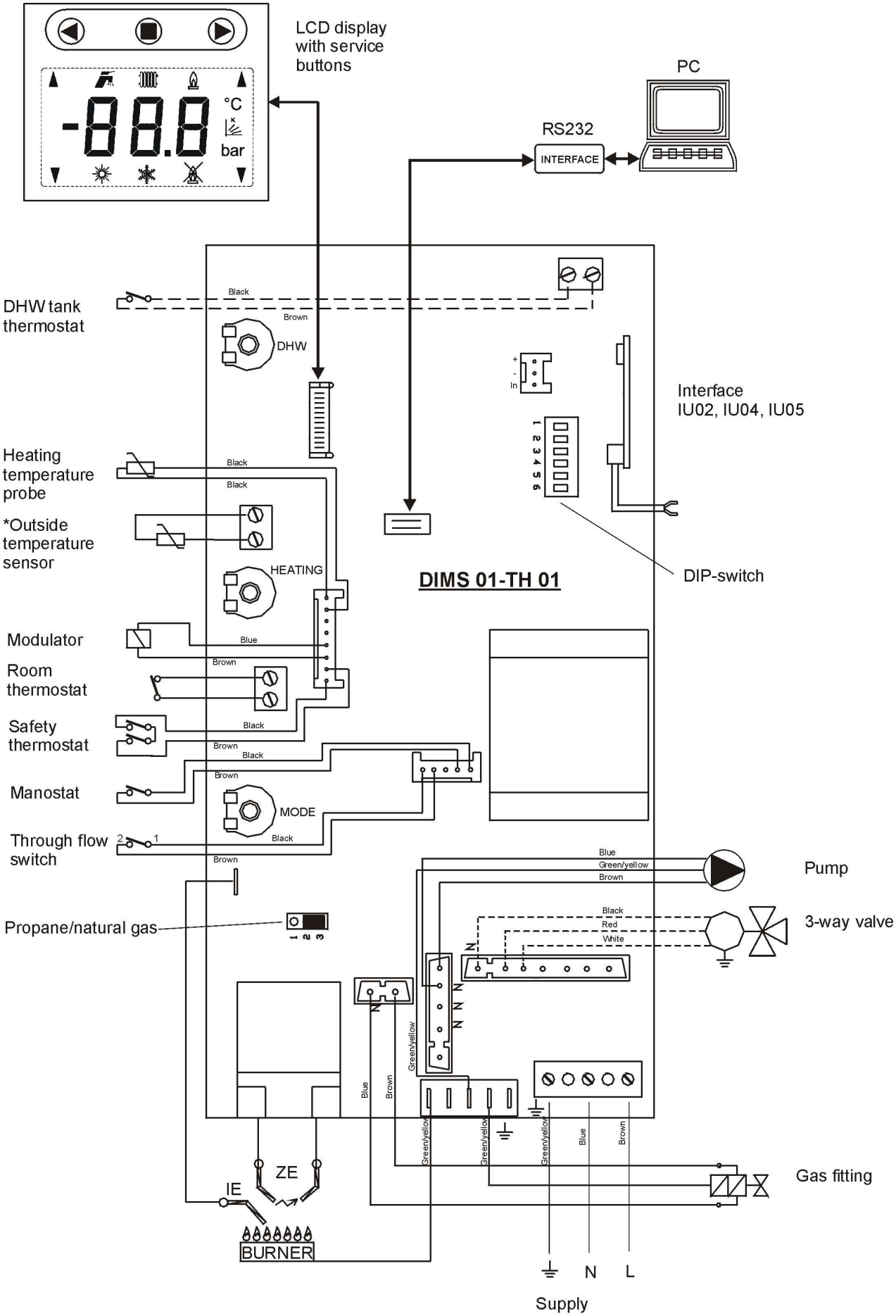
Gasket 1" store no. 40028
Gasket 3/4" store no. 40029
Gasket 1/2" store no. 40030

10.2 THERM DUO 50 FT set – side and top view





11.1 Wiring diagram of THERM DUO 50 FT connection



12 DIMS01-TH01 modulation electronics

Description of setting elements:

Jumper JP1 **– gas type selection** (natural gas / propane) – interconnection 2-3 = natural gas, interconnection 1-2 = propane

Dip-switch (Boiler type and parameters changing switch)

	DS1-DHW	DS2- ext. sensor	DS3 - cascade	DS4	DS5	DS6
OFF	tank	without ext. sensor	slave			
ON	through-flow	with ext. sensor	master	microswitch test		

Factory setting:DS1- according to the boiler type; DS2-OFF (mode 1.1), DS3-OFF;DS4-OFF, pump run-down 50% = 5 minutes; anticycling time 50% = 5 minutes; gas selection (JP1) depending on the order.

Description of operation:

1.1 Mode: Heating up the system without weather compensated regulation

Setting: Outside sensor not connected, service buttons DS2, DS3 – OFF.

The boiler starts working when the room thermostat closes (the mode switch being in the winter position). The pump and ignition automatics start operating too. The boiler is ignited at the set starting output. This is kept for 2 seconds after ignition (the feedback of the ignition automatics). Then the output is lowered to the minimum with slow linear rise (approximately 1 min.) up to the modulation point. The point value depends on the factory setting of the max. heating output. The boiler output control at this moment is PID (proportionate/integral/derivative) while the temperature set on the control panel knob is maintained (within 35 – 80 ^{o}C). When heating the system with a lower input than the minimum boiler output is the outlet heating water temperature exceeds the set temperature by 5 ^{o}C. At this moment the boiler stops burning, but the pump is running and the re-ignition is restricted for some time (the factory setting is 0 – 10 minutes). All this means the boiler is highly flexible heat source from the point of the number of consequently controlled heating systems (e.g. zone regulation, thermostatic valves, etc.).

When the room thermostat opens, the pump runs down in the set time (the factory setting is 0 – 10 minutes). This function is used to cool down the exchanger, to drain heat from the combustion chamber and to balance the temperatures of different heating elements (useful mainly for horizontal distribution systems) when room thermostats with PI link with short operating cycles (e.g. Honeywell CM707).

1.2 Mode: Heating up the system with weather compensated regulation

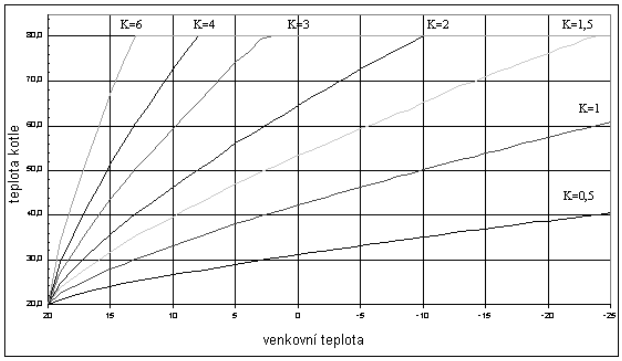
Setting: Outside sensor connected, service buttons DS2 – ON, DS3 – OFF.

The boiler operates on the same basis as above. The only difference is the temperature of the heating system is controlled depending on the outside temperature (measured by the outside sensor). The calculation of the necessary temperature of the heating system is a function of the outside temperature and factor **„K“** (weather compensation curve inclination). The factor is set by the service technician according to the nature of the place and the heating system. The user can set the demanded heat comfort with the heating water temperature knob on the control panel (the curve can be changed in the range of ± 15 °C of the heating water).

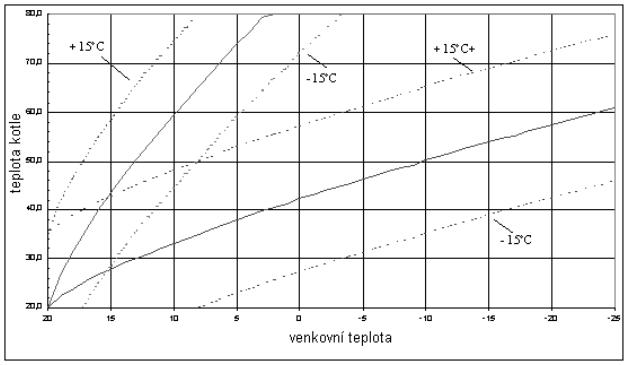
The weather compensation curve is calculated for the standard heating system with radiators.

Graphs of curves (inclination - change)

The inclinations



The changes



It follows that in this mode the knob on the control panel which is used for setting the temperature of the heating in fact shows the demanded temperature of the room. We recommend the initial service setting to be **„K" = 1.6.** The user's setting of the heating temperature knob to point upwards (which means 0 °C change). After 24 hours of test heating the setting can be changed according to the demands for heat comfort. The weather compensated regulation will still work and the set temperature will be maintained constant automatically.

Using this kind of boiler regulation you lower the operational costs and you improve the heat comfort (the heating elements are heated continuously). It can also be used as a pre-regulation of a primary heating circuit for zone regulation, mixing valves etc.

It is certain a room thermostat can be used to lower the temperature of the heated room. In this case we recommend the version without PI regulation (closing then operates on the basis of temperature differences). The knob for heating temperature setting is to be set to a value a little higher than it is when a room thermostat is not used.

If the outside temperature sensor is not working the failure is signalled and the boiler works in the previous mode (without weather compensated regulation).

Mode: Heating DHW tank

Setting: Service button DS1 – OFF, DS2 as above, DS3 – OFF.

The electronic regulation circuits are adapted for DHW tank heating. The boiler starts working when the tank thermostat closes. The relay of the 3-way valve is activated and the valve changes into the position for heating DHW. After 8 seconds the pump relay and the ignition automatics relay close as well. The boiler ignites at the starting output (2 seconds after ignition) and then the output rises to the maximum so that the outlet temperature is raised to 80 ^{o}C as soon as possible. This temperature is then maintained by PID regulation. When the tank is heated up, the thermostat opens and the boiler stops burning. After 10 seconds the pump stops and switches off the 3-way valve relay. The valve changes into the position for heating. While the valve is changing (about 8 seconds), any ignition demands are ignored. Only then can the boiler continue heating up the system (if required).

DHW tank heating is prior to the heating of the system if they are required at the same time.

Additional functions

- The pump starts running regularly when not operational (it runs for 3 minutes after 24 hours of inactivity).
- Antifreeze protection is activated when the temperature in the boiler falls bellow 8 ^{o}C. I.e. the pump starts running, the boiler ignites and it heats the circuit up to 35 ^{o}C. When this temperature is reached, it switches off.
- A re-check of a through-flow switch is activated if the pump runs for 15 seconds and the through-flow switch does not work. The pump stops and after 45 seconds another attempt at switching the boiler on is made. This is repeated 10x. After this the boiler has to be switched off and on by the mode switch. If the pump was inactive for more than 30 minutes before another boiler switch-on, the first interval of the pump is 180 seconds.

The accredited service technician is bound to inform the user about the correct use of the boiler, about its parts and safety elements, to fill in the guarantee sheet and to give the user this manual.

The user has to use the boiler only in the ways described in this manual. This is also the condition for guarantee. The user is strictly forbidden to change or interfere with the fixed parts of the boiler!

13. GUARANTEE AND LIABILITY FOR DEFECTS

The manufacturer is not to be held liable for any mechanical damage of individual components caused by malpractice, for defects caused by unprofessional handling with the electronics while adjusting or adding extension regulations, or for defects caused by using other parts and components than the original ones used by the manufacturer.

Further, the guarantee does not cover any defects caused by breaking the important notes and conditions stated in individual paragraphs of this manual for installation and maintenance.

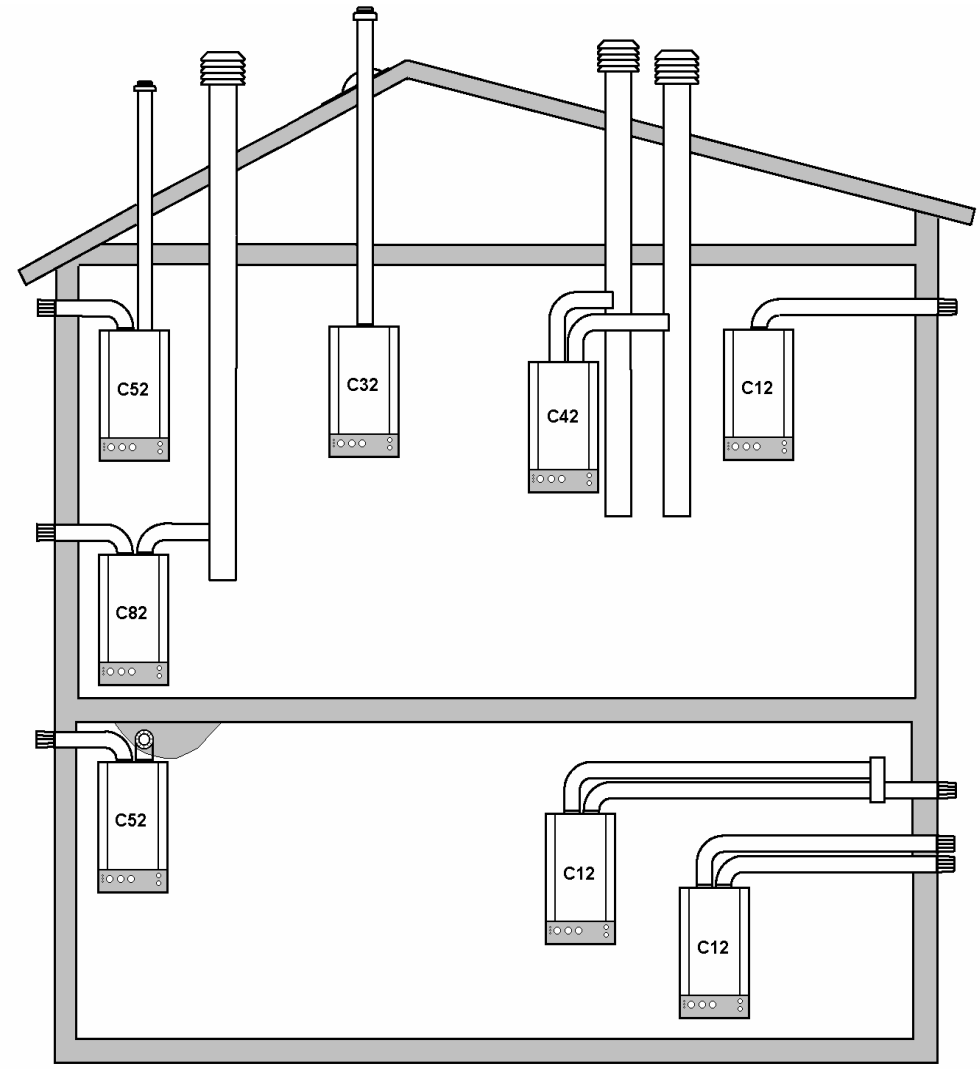
The guarantee does not either cover situations caused by non-standard conditions in the distribution network (voltage fluctuation and overvoltage peaks, gas pressure and purity etc.), defects of appliances outside the boiler, which influence its function, wrong flue exhaust, impurities in the combusted air, damage caused by external influence, mechanical damage, storing, transport and defects caused by natural disasters.

In these cases the service company may also require the customer to pay for the repairs.

Conditions for guarantee application:

1) The maintenance check of the boiler must be carried out 1x a year. It may be done by an authorized company bound by contract.
2) All guarantee repairs and yearly maintenance checks must be recorded on the appendix of this manual and it must be submitted.

14. INSTALLATION VERSIONS



Realizations:

C_{12} – Coaxial horizontal version with the outlet into the perimeter wall. The piping can also be doubled, the outlets are either concentric or placed so closely to each other (not further than 50 cm) that they are exposed to the same climatic conditions.

C_{32} – Coaxial vertical version with the outlet onto the roof. The piping can also be doubled, the outlets are either concentric or placed so closely to each other (not further than 50 cm) that they are exposed to the same climatic conditions.

C_{42} – Separated connection to two pipelines within the same shaft. The outlet of both shafts is either concentric or placed so closely to each other (not further than 50 cm) that they are exposed to the same climatic conditions.

C_{52} – Separated pipelines with the outlet into the perimeter wall or onto the roof, into two zones of different pressure, but never into two opposed perimeter walls.

C_{82} – Separated connection with the flue exhaust into a separate or common chimney. The supply of combustion air is provided through the perimeter wall.

15. RECORD OF GUARANTEE AND POST-GUARANTEE REPAIRS AND YEARLY MAINTENANCE CHECKS

Operation	Authorized company	Customer's signature	Date

Packaging and product disposal

All material used for production correspond with the requirements of valid norms and regulations.
The product packaging is to be handed in the paper disposal area, the foil in the disposal containers for plastics.
The boiler parts made of steel, copper and copper alloy is to be handed in the metal disposal area.
Heat insulation of the combustion chamber is harmless to health and can be disposed of in the domestic refuse.

Thermona®
všechno co děláme hřeje

PRODUCT QUALITY

AND COMPLETNESS CERTIFICATE

THERM gas boiler

Type: **DUO 50 FT**

Serial number:

The products fulfils the valid guidelines, technical norms and regulations and its operation is safe under common conditions. Measures have been taken to secure the accordance of this product with the technical documentation and with the basic technical, safety and hygienic requirements.

The product is certified by **Engineering testing institute,** authorized person 202:

THERM DUO 50 FT - certificate for **type** testing according to EC guidelines for gas appliances **90/396/EHS** no. E-30-00123-06

THERM DUO 50 FT - certificate for **efficiency** according to EC guidelines **92/42/EHS** no. č. E-30-00124-06.

Technical check

date: .....

stamp and signature: .....

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